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NUTRITION AND ORAL HEALTH IN CHILDREN

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ABSTRACT

Oral health is integrated into general health and it is essential to well-being and quality of life. Oral and systemic health is conditioned by proper nutrition. This article highlights the consequences of inadequate nutrition on oral health in children and how certain vitamin or nutrient deficiencies can condition the occurrence of different diseases at this level. Diseases of the oral cavity can be prevented both by proper and balanced nutrition, and by proper hygiene. Nutritional habits and, implicitly, oral and systemic health should be taken into account, as children's oral health is a predictor for the oral health of the future adults.

Key words: oral health, nutrition, child

INTRODUCTION

Oral health is integrated into general health and it is essential to well-being and quality of life. In 1946, the World Health Organization underlined the correlation between oral health and quality of life. Health is "the complete physical, mental and social well-being, not just the absence of illness or infirmity" (1).

Oral care programs include oral hygiene, fluoride prophylaxis, regular check-ups, professional oral hygiene sessions and secondary prevention programs, and last but not least, healthy eating (2).

A correct diet means a balanced diet so that the body can get the nutrients needed for proper general health and, thus, oral health (periodontal tissue, saliva quality and quantity, dental elements). Unhealthy eating can affect the integrity of the oral cavity and can cause disease progression at this level (3).

In 1994, the United States reported 2.9 million acute dental episodes in both adults and children. For the age group of 5-17 years, these dental episodes accounted for 1.2 million days of missed classes in school (4).

NUTRITION AND DEVELOPMENT OF THE ORAL CAVITY

A deficiency of vitamins and minerals in the preconception phase influences the development of the future embryo, influencing the dental organogenesis, the development of the skull and jaw.

In infants, the pre-teething phase is influenced by the nutritional condition. Deficiencies of vitamins A, B, C, D and protein are associated with disorders of oral structures (5). Breastfeeding is ideal because of its overall health benefits. The World Health Organization and the American

Pediatric Association have shown that breastfeeding influences swallowing, jaw growth, correct teeth alignment and hard palate modeling. Artificial feeding may cause the occurrence of arterial hypertension, obesity, cardiovascular disease and inflammation of the oral mucosa.

NUTRITION AND DISEASES OF THE ORAL CAVITY

Due to the high prevalence of malnutrition, 5.6 million children under the age of 5 in developing countries contribute to the country's death rate, i.e. 10 children per minute (UNICEF 2006) (6). Malnutrition not only causes scurvy but also dental development impairments (late tooth eruption), exacerbates infection and periodontal disease (7).

Malnutrition occurs when there are deficiencies in protein and/or energy foods. An insufficient amount of protein can cause lingual papillary atrophy, dentin genesis modification, cimentogenesis alteration, changes in jaw development, malocclusion, or linear enamel hypoplasia (8). An insufficient lipid intake can cause inflammatory and degenerative pathologies, hyposalivation, degeneration of the glandular parenchyma, alteration of mucosal tropism (9). Also, an insufficient amount of carbohydrates can lead to altered organogenesis, the influence of metabolism on dental plaque, caries, periodontal disease.

Diet influences the health of the oral cavity, it conditions the onset of caries, the development of enamel, the onset of dental erosion, periodontal health and oral mucosa in general.

Thiamine deficiency (vitamin B1) is associated with cracked lips and angular cheilosis, while the deficiency of riboflavin (vitamin B2) and niacin (vitamin B3) causes inflammation of the tongue, angular cheilosis and ulcerative gingivitis. Periodontal disease, anemia, burning sensation in the oral cavity are associated with vitamin B6 deficiency (5). Folate deficiency (vitamin B9) is often associated with neural tube defects, but some recent studies have found a reduction in the occurrence of split lip with or without cleft palate when pregnant women receive supplemental folic acid (10). Also, vitamin B12 deficiency causes angular cheilosis, gingival bleeding, painful mouth ulcers (6).

Vitamin D plays an important role in the absorption of calcium and phosphorus, allowing proper mineralization of bones and teeth. A deficiency of vitamin D will cause dental hypo mineralization, delay in dental eruption or the absence of lamina dura (6), also development of dental caries (11). The American Academy of Pediatrics recommends that all infants (naturally or artificially fed) receive a daily supplement of 400 IU of vitamin D (12).

Vitamin A has been shown to prevent cleft palate (13, 14). The deficiency of this vitamin causes dental anomalies, tooth fragility, salivary gland degeneration, and caries (15).

Vitamin C is essential for collagen synthesis. Deficiency of vitamin C is associated with irregular dentine formation, gingival bleeding, and delayed healing of lesions (6).

RECOMMENDATIONS FOR THE PREVENTION OF ORAL CAVITY DISEASES

Poor nutrition, especially consuming sweet foods and drinks, is the main cause of tooth decay (16). Children who do not have a proper diet may develop nutritional deficiencies or obesity and, implicitly, dental pathologies. There are studies that reported that there is an inverse relationship between milk consumption involving adequate calcium intake and the consumption of sweetened beverages (17). Families from low social background give sweetened drinks to

small children instead of milk.

Cavities represent a demineralization of the inorganic part of the tooth with the dissolution of the organic substance, having multifactorial etiology. Demineralization of enamel and dentin is determined by the presence of organic acids that appear in the dental plaque due to bacterial activity, through the anaerobic metabolism of sugars in the diet. Although cavity development requires the presence of bacteria and sugar, it is also influenced by susceptibility of teeth, bacteria, sugars, and the amount and quality of salivary secretion. For example, lactose produces less acidity than other sugars (18, 19).

To prevent caries growth, it is advisable to increase the consumption of dietary fiber to reduce sugar absorption; dairy consumption, phosphorus, calcium and casein inhibit caries formation, the proper chewing of food adequately stimulate salivary secretion (20).

Fluoride is very important in the prevention and control of dental caries. In children, fluoride reduces caries by 20-40% but does not completely eliminate them (21).

Malnutrition and poor oral hygiene are two important factors that may lead to necrotizing gingivitis. Programs for oral cavity disease prevention, especially for children, should include a correct assessment of the immune system and proper nutrition. It should also be considered that some nutrients have a very important role in the inflammatory process, an observation that confirms the relationship between diet and periodontal disease (22). The amount of vitamin C should be supplemented, which is fundamental for activating repairing mechanisms due to its antioxidant properties (23).

A significant known correlation is between candidiasis and lack of folic acid, vitamins A, B1, B2, C, K, zinc at the expense of a carbohydrate-rich diet (23).

Diets rich in fruits and vegetables, especially tomatoes and their derivates, significantly reduce the risk of leukoplasia. Changes in the tongue, papillary atrophy and ulcerations are possible in the case of deficiencies of iron, folate and vitamin B12. Deficiency of vitamin B12 may cause glossitis, angular cheilitis, recurrent oral ulcers, oral candidiasis and erythematous mucositis (23).

For toddlers, proper oral hygiene is recommended after the first tooth eruption, also encouraging milk consumption, cleaning gums after eating to reduce bacterial transmission. The toddler should not be allowed to fall asleep with the milk bottle. For children 1-3-year-old, teeth should be brushed twice a day for 2 minutes. They should avoid drinking sweetened drinks. For older children, it is recommended to brush their teeth twice a day for 2 minutes. They should consume dairy products, introduce vegetables or fruits when consuming carbohydrates, limiting snacks before bedtime, limiting the consumption of sweet drinks (24-27). Proper nutrition along with proper vaccination (28) sets the premises for a good general health.

CONCLUSIONS

Dietary habits to support oral health and systemic health are similar. Pre-school programs should promote healthy behaviors for proper physical and psychosocial development. Children's oral health is a predictor for the oral health of future adults.

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